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Gender and professional e-networks: Implications of gender heterophily on job search facilitation and outcomes

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ABSTRACT

A lack of access to high stature, typically male, professional contacts and the social capital they provide is one likely barrier to women's career advancement. The increasing use of electronic professional networking sites is making these high value contacts more accessible and changing the composition characteristics of people's professional networks; yet limited research explores e-networks in professional contexts. This study examines the role of gender heterophily on e-network facilitation and, in turn, on a set of job-search related outcomes through a survey of full-time, salaried LinkedIn users. We find that women's e-networks are characterized by greater gender heterophilly than men's. E-networks comprised of high proportions of ties with men enabled individuals to experience shorter job search duration and attain higher salaries. These effects were partially explained by the increased likelihood of receiving direct assistance from a network contact to secure new employment (i.e. network facilitation).
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1. Introduction

Internet technologies now enable professional, social, and labor market interactions to take place across increasingly 'virtual' contexts (Benson, Morgan, & Filippaios, 2014; Benson et al., 2014; Bryan-Kinns, Healey, & Leach, 2007; Luther, Caine, Ziegler, & Bruckman, 2010). The growing popularity of on-line social network sites (SNS) suggests that much professional social networking is, or will soon be, carried out online (Beer, 2008; Benson et al., 2014). The leading social networking site, Facebook, and leading professional networking site, LinkedIn, now claim more than 1.79 billion and 467 million worldwide users respectively (company websites, accessed December, 2016). Most extant research on e-networks, however, neglects professional networks. Research is needed to provide greater understanding of e-networks in professional contexts.

Traditional social networking (i.e., socializing face-to-face and attending professional meetings) has been shown to positively influence a wide range of career outcomes including income, advancement, employability, career satisfaction, and job search success (Burt & Celotto, 1992; DiRenzo, Greenhaus, & Weer, 2015; Gibson, Hardy & Buckley, 2014; Forret & Dougherty, 2004; Gould & Penley, 1984; Luthans, Welsh, & Taylor, 1988; Michael & Yukl, 1993). Studies suggest, however, that men and women may not benefit equally from their social networks. While women may network more frequently than men, they accrue fewer benefits with regard to both objective and subjective career outcomes (Forret & Dougherty, 2004; Ioannides & Loury, 2004; Mayer, 2009; Morgan & Trauth, 2006; Van Emmerik, Euwema, Geschiere, & Schouten, 2006). Scholars have posited that this may be due to differences in the structure and composition of men's and women's networks, in particular women's relative lack of ties to high-status professionals (Gremmen, Akkerman, & Benschop, 2013; Kegen, 2013; Ibarra, 1992, 1993; O'Connor, 2013).

E-networks have the potential to help counteract the negative impacts of the traditional "Old Boy's Network" by providing network opportunities previously unavailable to women (Knouse & Webb, 2001; Rand & Bierema, 2009). However, only a limited number of studies specifically address the role of gender in e-networks (e.g., Barker, 2009; Brown, Howe, Ihbe, Prakash, & Borders, 2008; Thelwall, 2008; Venkatsubramanyan & Hill, 2009). Further, outside of a few exceptions, which suggest the potential of e-networks to facilitate positive outcomes (e.g. Benson et al., 2014; Rand & Bierema, 2009), there remains a dearth of research exploring the characteristics of professional e-networks and the professional value derived from them. As such, the objective of this study is to

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advance understanding of professional e-networks and address calls for research on gender differences in networks (Gremmen et al., 2013; Kegen, 2013; Rand & Bierema, 2009) by providing insights into the role of gender heterophily in the context of job-search related outcome measures.

We identify differences in the composition characteristics of professional e-networks across genders and explain how these characteristics may differentially affect the job search outcomes for women and men. We draw on prior work that elaborates the homophily principle, that is, the propensity of individuals to establish socially similar contacts (Ibarra, 1992; Ingram & Morris, 2007; Reagans, 2005). We explore the value of gender-heterophily in e-networks, that is, the extent to which networks are comprised of cross-gender relationships. Additionally, we examined the value of male and female contacts in the facilitation and acquisition of important job search outcomes, including search duration and salary attained. We conclude with a discussion of the findings and suggestions for future research.

2. Theory and hypotheses

Studies repeatedly show that expansive social networks can lead to positive career outcomes including job search and career success (Forret & Dougherty, 2004; Seibert, Kraimer, & Liden, 2001; Shatnawi, 2015; Wanberg, Kanfer, & Banas, 2000; Wolff & Moser, 2009). Recently scholars have suggested that the quantity of network contacts may be overvalued, and have called for investigations into network *quality* to identify the types of contacts and network composition characteristics that are most valuable to individuals' careers (e.g., Belliveau, 2005; Lambert, Eby, & Reeves, 2006; Obukhova & Lan, 2013). Diversity, or *heterophily*, in social networks offers advantages by providing individuals with better information, more resources, and greater access to employment opportunities (Joshi, Liao, & Jackson, 2006; Kalmijn & Flap, 2001; Son & Lin, 2012). Yet, despite these benefits, research has shown a clear tendency toward *homophily*—ties to individuals having similar social characteristics such as sex, race, and education—in social networks (McPherson, Smith-Lovin, & Cook, 2001; Miller, Lincoln, & Olson, 1981; Pfeffer, 1982, 1985; Ibarra, 1992, 1995, 1997).

Individuals can generate network heterophily by interacting with colleagues and professionals who are different from themselves (Westphal & Milton, 2000). Scholars have suggested two mechanisms to explain why this does not occur: *choice* and *induced* homophily (McPherson & Smith-Lovin, 1987). One mechanism is *choice homophily*. Congruent with theories of interpersonal attraction, choice homophily stems from individual preferences for relationships with similar others (Brass, 1985; Ingram & Morris, 2007; Marsden, 1988; Reagans, 2005). Another mechanism, *induced homophily*, is the result of structural constraints that limit the availability of, or access to, dissimilar others (Blau, 1977; McPherson & Smith-Lovin, 1987; Mehra, Kilduff, & Brass, 1998). Systematic barriers continue to cause many professions to remain highly segregated by gender and men also remain disproportionately represented at higher levels of organizational hierarchies (Barbulescu & Bidwell, 2013; Cormier, 2006; Huffman, Cohen, & Pearlman, 2010; Morrison & Von Glinow, 1990; Reskin & Bielby, 2005). These enduring realities limit the extent of cross-gender interaction in the workplace. These perspectives suggest that gender-based homophily is the result of preferences for same-sex social relationships (choice) and limited opportunities to interact with individuals of the opposite sex (induced).

Prevailing theory suggests that network homophily is more detrimental to women's careers because male contacts are more likely to be in influential, high-status positions (Gremmen et al., 2013; Ibarra, 1992; Kegen, 2013), with greater ability to reach up in the hierarchy and provide valuable information regarding employment and advancement opportunities (Belliveau, 2005). Research has shown that women obtain higher incomes, better career-related information, and more job search success when using male contacts in their search for new employment (Berger, 1995; Hanson & Pratt, 1991; Montgomery, 1991; O'Conner, 2013). These findings suggest that without the typical barriers often experienced by women (for reviews see Haile, Emmanuel, & Dzathor, 2016; Simard, 2007), individuals engaged in the labor market will seek high-status, male connections. That is, for women in the labor market the desire for valuable ties will override the tendency to form ties with similar others, reducing choice-based homophily among women while further embedding men in same-sex interactions (Ibarra, 1992).

Scholars have argued that e-networking may reduce barriers by providing greater geographic reach and access to potentially valuable contacts (Benson et al., 2014; Rand & Bierema, 2009). Due to e-networks, individuals no longer need to physically meet one another to establish a connection. Social network sites make it possible to view the composition of other people's networks, which enables individuals to see who their contacts are tied to, and potentially reach out to those individuals and make connections with the click of a mouse. Hence, e-networks may facilitate connections across weak ties (Granovetter, 1973) and remove the barriers of formal introductions, physical interaction, and geography. This is particularly relevant to women, who traditionally have been excluded from opportunities to interact through informal social events and other informal networking opportunities in the workplace (Lambert et al., 2006; Russell, 1994). Further, because women perceive greater value in online interactions and are more likely to use social network sites than men (Debrand & Johnson, 2008; Hargittai, 2007; Pederson & Macafee, 2007), there is reason to believe that women may capitalize on these advantages. Therefore, given that individuals prefer interaction with high-status others in order to gain access to valued resources (Lin, 1982), that in professional contacts, a greater proportion of high-status positions are held by men, and that e-networks may reduce barriers that prevent women from making cross-gender connections, we hypothesize:

Hypothesis 1. *Women's professional e-networks will be characterized by greater gender heterophily than men's e-networks.*

In the preceding section we suggested that the desire for career-enhancing contacts may supersede women's desire for same-sex contacts, leading women to create more cross-gender connections than men. Embedded in this argument is the notion that male contacts, in general, carry greater career-enhancing benefits than female contacts and thus in the absence of barriers, both men and women will populate their networks with predominantly male-contacts so as to maximize their social capital. Although research commonly notes the broad influence of social capital in careers, it is essential to clarify that simply "*having* social capital might not have a causal effect on labor-market outcomes, but *using* it does" (Obukhova & Lan, 2013, p. 2205).

One of the more important uses of social capital in the professional context is to support the acquisition of new employment. While individuals rely on their networks for various forms of guidance and information (e.g. psychosocial support, mentorship, competitive salaries, etc.), there is perhaps no more tangible value a contact can provide than assisting an individual during a job search. Research shows asking members of their social networks for help is the primary means through which individuals search for and find employment (Granovetter, 1973; Ioannides & Loury, 2004; Marsden & Gorman, 2001; O'Conner, 2013). We focus on the direct assistance by a network contact in the successful acquisition

of new employment. We refer to this direct assistance as *network facilitation*, and in the sections that follow we discuss the role of network facilitation as an explanatory mechanism in the relationship between heterophily and desirable job search outcomes.

Direct assistance from contacts has been shown to positively influence job search outcomes, resulting in more interviews, greater income, higher career satisfaction, and shorter search time (Bozionelos, 2008; Fernandez & Weinberg, 1997; Obukhova & Lan, 2013; Yakubovich & Lup, 2006). A primary reason for this is that direct referrals are widely considered the best, most reliable source of job candidates (Han & Han, 2009; Shwed & Kalev, 2014) as it lowers recruiting costs and improves matching, fit, and social support (Castilla, 2005; Fernandez, Castilla, & Moore, 2000).

Two inter-related reasons suggest that male contacts are better able to help individuals secure new job opportunities than female contacts: 1) men's traditional position in the labor market/organizational hierarchy and 2) the value and reach of their networks. As mentioned previously, men typically hold formal and informal positions of power within organizations providing them greater discretion and influence (Belliveau, 2005). With men commonly occupying these positions, women hold less central positions in intra- and inter-organizational networks, thereby having less control over promotions and hiring decisions (Ibarra, 1993). Moreover, as a consequence of having greater centrality, men's networks are typically larger and characterized by greater occupational diversity than women's networks as well (Campbell, 1988; Fischer & Oliker, 1983; McPherson & Smith-Lovin, 1982), which provides men with greater reach and the ability to provide more expansive access to job leads and decision makers. This makes it likely that male contacts will have both greater influence over hiring decisions and better knowledge regarding job opportunities. Hence, we hypothesize that greater proportions of male contacts in professional e-networks will relate to higher incidences of network facilitation resulting in the acquisition of new employment.

Hypothesis 2. *Network facilitation will mediate the relationships between the proportion of male contacts in the e-network and a) job search duration and b) salary attained.*

Further, heterophily may provide greater advantages to women than men (Ibarra, 1992; South, Bonjean, Markham, & Corder, 1982). If male contacts are indeed of greater value and relate to increased network facilitation (help that leads to a job), e-network diversity may be less valuable for men than for women. As stated above, male contacts offer greater job market benefits (Belliveau, 2005; Gremmen et al., 2013; Kegen, 2013). But gender heterophily for a man's professional network implies a greater number of female contacts that may not offer these benefits. Therefore, while heterophily brings about network advantages to women via increased access to valuable male contacts; it may in fact be detrimental to men who will derive less value from female contacts. As such, we can expect that although gender-based heterophily will likely increase incidences of e-network facilitation for women, it will decrease e-network facilitation for men. Fig. 1 illustrates our conceptual model and each of the hypothesized relationships.

Hypothesis 3. *E-network heterophily will be more beneficial for women such that it will have a stronger positive association with network facilitation for women than for men.*

3. Method

Data were collected from users of the professional network site LinkedIn. Informed consent was obtained and privacy rights were observed. LinkedIn users were chosen because LinkedIn is the largest professional social network site with 467 million (company website accessed December, 2016). Unlike online social network sites such as Facebook, Twitter, and Instagram, LinkedIn focuses on professional social networking, seeking to "connect the world's professionals" (LinkedIn Corporation, 2015). Professional social networking focuses on maintaining contacts of a business nature, rather than including non-professional social interactions. The use of data collected from LinkedIn users thus provides a robust and accurate representation of the impact of professional e-networks because there is no ambiguity as to whether network contacts were created for professional opportunities as opposed to leisure activities.

3.1. Sample

The sample was developed with the help of a market research firm. From the firm's panel of potential respondents, individuals who obtained new employment within the last five years (i.e. transitioned from one firm to a different firm) and were active LinkedIn users were identified for inclusion in the study. Initially, 4823 individuals were identified and invited to complete the survey, yielding 2003 complete responses. We then further restricted our analysis to include only salaried employees in order to minimize potential effects stemming from job type, and to only those individuals who had obtained new employment within the last 12 months so as to limit recall bias and ensure that all respondents experienced a similar economic landscape (Franzen & Hangartner, 2006; Green, Tigges, & Diaz, 1999). The final sample consisted of 366 respondents and was 58% male. The average age of respondents was 44.77 years with 17.62 years of formal education, 22.1 years of full-time work experience and an average annual income of $68,858. Respondents represented a wide range of industries with the most prevalent being education (12.0%), technology (9.3%), manufacturing (8.2%), medicine (7.9%), and all

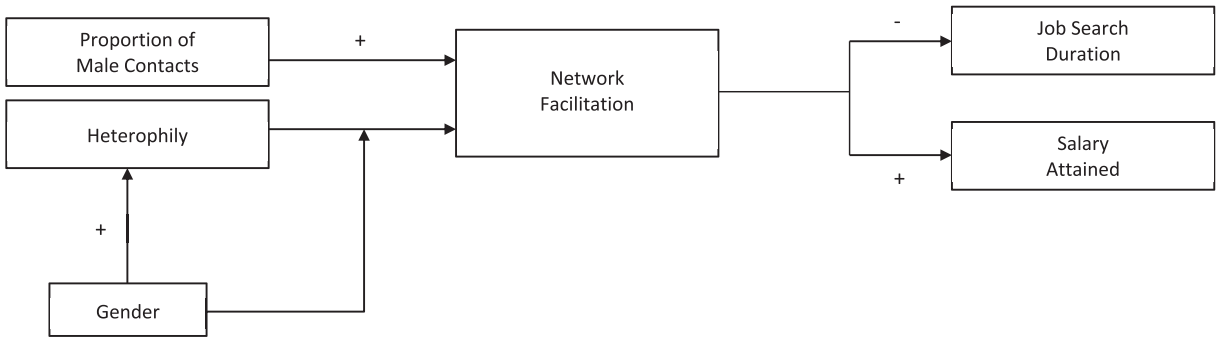

Fig. 1. Theoretical model.

others representing less than 5% of the sample respectively.

3.2. Measures

The dependent variables, job search outcomes, were assessed with two measures: 1) *Job search duration* (the number of months it took participants to acquire their most recent job) and 2) *Salary attained* (the log of the individual's reported annual salary).

Network facilitation was assessed as *direct assistance by network contact* (participants responded to the question "Did a LinkedIn contact directly assist you in getting your current job?" (yes = 1, no = 0)).

Network composition characteristics were collected from participants. Participants were asked to reflect on their LinkedIn networks. They were instructed to view the contacts in their network and determine which contacts were in their network at the beginning of their most recent job search. They reported the total number of contacts in the network at that time and stated the specific number of male and female contacts respectively. These responses were then used to construct measures for heterophily and the proportion of male contacts in one's network.

Control variables included: *education* (total years of education after kindergarten), *experience* (total years of full-time work experience), *experience-squared* (the quadratic of experience was also included in the analysis to account for diminishing returns), and *reservation salary*. Salary expectations likely relate to both dependent variables in this study. Therefore, participants responded to the following question, "When you were searching for your current job, what was your annual reservation salary (i.e., the lowest wage you were willing to accept)?" The log of the reported reservation salary was used during analysis.

Additional controls were *industry* and *job level*. Participants were asked to select from 35 categories the industry that best matches their primary job. Responses were then aggregated to the eleven industries that best match the two-digit industry codes from the 2007 Census Industrial Classification. The 11 industry categories include: 1) Professional and Business Services, 2) Leisure and Hospitality, 3) Other Services, 4) Public Administration, 5) Health Care and Social Assistance, 6) Manufacturing, 7) Wholesale and Retail Trade, 8) Transportation and Utilities, 9) Educational Services, 10) Construction, Mining, and Agriculture, and 11) Financial Activities. Participants were also asked to select which category best described their current role or position: 1) Non-management, 2) Lower Management (e.g., supervisory personnel or first-level manager), 3) Middle Management (e.g., department or business unit head), 4) Upper Management (e.g., high level, senior executive that sets policy for the company).

4. Analysis & results

Descriptive statistics and correlations among variables are presented in Table 1. Consistent with research on traditional professional networks, our analysis indicates a proclivity toward gender homophily in professional e-networks. On average, same-sex contacts represented 62.8% of men's networks and 55.4% of women's networks.

Hierarchical and logistic regression analyses were used to test the hypotheses. As expected, our findings indicated that women developed greater heterophily than men ($\beta = 0.22$, $p < 0.01$). Therefore Hypothesis 1 was supported. To test Hypothesis 2, we analyzed the influence of the proportion of male contacts within the network on job search duration and salary attained, through network facilitation. High proportions of male contacts represent homophily for men and heterophily for women respectively. The findings are presented in Tables 2 and 3 and indicate partial support for Hypothesis 2. The proportion of male contacts was associated with network facilitation ($p < 0.01$) and both job search duration ($\beta = -0.10$, $p < 0.05$) and the salary attained ($\beta = 0.11$, $p < 0.01$). Additionally direct assistance from a network contact related to both shorter job search ($\beta = -0.13$, $p < 0.01$) and higher salaries ($\beta = 0.08$, $p < 0.01$). Following Baron and Kenny (1986), the results in Table 3 support full mediation on job search duration as proportion of male contacts lost all significance when adding network facilitation to the model, and partial mediation on salary attained, as the significance of proportion of male contacts was reduced when adding network facilitation to the model. Further mediation tests were conducted to confirm these results by running Sobel

Table 2
Logistic Regressions: The effects of the proportion of male contacts (Model 1) and the interaction of heterophily and gender (Model 2) on network facilitation.

	Model 1	Model 2
Log Reservation Wage	−0.04	−0.05
Education	−0.02	−0.02
Experience	−0.01	−0.00
Experience-squared	0.00	0.00
Industry1	−0.44	−0.48
Industry2	−0.75	−0.81
Industry3	−0.95†	−0.95†
Industry4	−1.1	−1.15†
Industry5	−0.68	−0.67
Industry6	−0.25	−0.32
Industry7	−0.60	−0.61
Industry8	−0.94	−0.98
Industry9	0.05	0.11
Industry10	−1.04†	−1.01†
Job level1	0.49	0.51
Job level2	0.76**	0.75*
Job level3	1.73**	1.70**
Job level4	−0.82	−0.96
% Male Contacts	1.75**	
Heterophily		−0.55
Gender		−0.65**
Gender x Heterophily		3.18*
Constant	0.35	1.50†

N = 366. †$p < 0.10$; *$p < 0.05$; **$p < 0.01$.
Note: Industry 11 (financial activities), as well as Position 5(non-management) and Position 6 (other) are the left out reference groups for the categorical variables.

Table 1
Means, standard deviations, and correlations.

	M	SD	1.	2.	3.	4.	5.
1. Gender	0.42	0.49					
2. Network Heterophily	0.41	0.17	0.22**				
3. % Male Contacts	0.56	0.19	−0.37**	−0.20**			
4. Network Facilitation	0.61	0.49	−0.11*	0.04	0.14**		
5. Job Search Duration	8.74	12.53	0.04	0.08	−0.08	−0.13*	
6. Salary Attained	11.00	0.53	−0.13**	0.04	0.12*	0.10†	−0.12*

N = 366. The partial correlations in this table controlled for reservation salary, education, work experience, industry, and job-level.
†$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

Table 3
Linear Regression: The effect of male-density on job search and career success mediated by network facilitation.

	Job search duration			Salary attained		
	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β
Step 1						
Reservation Wage	−0.07	−0.06	−0.06	0.30**	0.29**	0.29**
Education	0.01	0.02	0.02	0.17**	0.16**	0.17**
Experience	0.06	0.07	0.07	0.63**	0.63**	0.63**
Experience-squared	0.06	0.07	0.06	−0.52**	−0.53**	−0.53**
Industry1	0.19*	0.20*	0.19*	0.09	0.08	0.08
Industry2	0.15*	0.15*	0.14*	−0.14**	−0.14**	−0.14**
Industry3	0.16*	0.16*	0.14*	−0.21**	−0.21**	−0.20**
Industry4	0.11†	0.11†	0.10	−0.04	−0.04	−0.03
Industry5	0.08	0.07	0.06	−0.07	−0.06	−0.05
Industry6	0.20**	0.21**	0.20**	0.02	0.01	0.01
Industry7	0.08	0.09	0.08	0.03	0.04	0.04
Industry8	0.03	0.04	0.03	0.08	0.09	0.08
Industry9	0.21**	0.21**	0.21**	−0.20**	−0.20**	−0.20**
Industry10	0.16*	0.17*	0.15*	−0.06	−0.06	−0.05
Job level1	−0.12*	−0.12*	−0.12*	0.01	0.01	0.01
Job level2	−0.07	−0.06	−0.05	0.12**	0.11**	0.11**
Job level3	0.07	0.07	0.09	0.19**	0.19**	0.19**
Job level4	−0.01	−0.01	−0.02	0.02	0.02	0.02
Step 2						
Proportion of Male Contacts		−0.10*	−0.06		0.11**	0.08*
Step 3						
Network Facilitation			−0.13**			0.08*
R^2	0.07	0.08	0.09	0.42	0.43	0.43
ΔR^2	0.07†	0.01†	0.01*	0.42**	0.01*	0.01†

†$p < 0.10$. *$p < 0.05$. **$p < 0.01$.

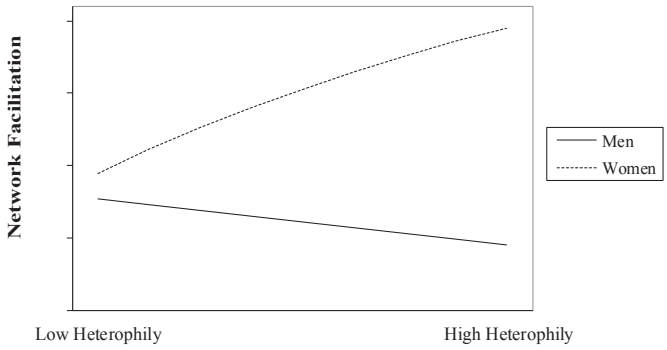

Fig. 2. The interaction of heterophily and gender on network facilitation.

(1982) tests which generate a z-statistic that indicates a significant drop in the beta weight when the mediator is entered into the model. Results of Sobel tests also supported Hypothesis 2 and indicated that network facilitation mediated the relationships between proportion of male contacts and both job search duration ($z = -1.98$, $p < 0.05$) and salary attained ($z = 2.09$, $p < 0.05$).

Finally, as shown in Table 2 (Model 2) Hypothesis 3 was also supported ($p < 0.05$) as network heterophily had beneficial effects during job search for women, yet detrimental effects for men. Fig. 2 represents the contrasting effects of heterophily on the likelihood of securing new employment through a network contact (i.e. network facilitation) and suggests that while gender heterophily may be advantageous to women, homophily was more useful to men.

5. Discussion

Researchers, managers and policy makers widely recognize that technology advances are changing the nature of social interaction and work. Social networks have been shown to positively influence a wide range of occupational outcomes including the likelihood that an individual will enter the field of their degree (Franzen & Hangartner, 2006), attain a higher salary and receive promotions (Burt & Celotto, 1992; Gould & Penley, 1984; Michael & Yukl, 1993), and experience greater job satisfaction (Forret & Dougherty, 2004; Seibert et al., 2001). The emergence and increasing use of social network sites has created both a need and opportunity for research to extend knowledge of professional network effects to the e-context, and understand the role of gender in these relationships as e-networks may provide different challenges and opportunities to women. Our study advances these goals by investigating the role of gender heterophily on e-network facilitation and, in turn, on a set of job-search related outcomes.

Our findings indicate that women's e-networks are characterized by greater gender heterophily than men's. Additionally, we found that the proportion of men in one's e-network has beneficial effects during job search. Specifically, a greater proportion of male contacts relates to shorter job search duration and higher salaries attained, through greater occurrence of network facilitation. Finally, the job search-related benefits of gender heterophily, in terms of network facilitation, are only prevalent for women but not men. That is, heterophily was positively related to greater facilitation among women, but had no effect for men.

This study contributes to the network and careers literature in at least three ways. First we highlight the importance of the quality of ties as opposed to quantity of ties. We extend studies showing that different types of ties provide differential value (Blake-Beard, 2001; Ibarra, 1993; Ioannides & Loury, 2004; Knouse & Webb, 2001; Ragins & Cotton, 1999), with our findings indicating that electronic ties to male contacts may be more valuable during the job search process. This finding is particularly important because it suggests that homophily may be advantageous to men, which contrasts the normative contention that heterophily is a valuable trait in professional networks. As such, future research must continue to investigate the boundary conditions around the value of heterophily in professional networks.

Second, our study extends knowledge of social networks to include e-networks and the professional context. We show that tendencies towards homophily found in traditional face-to-face networks are found also in e-networks (McPherson et al., 2001; Miller et al., 1981; Pfeffer, 1982, 1985; Ibarra, 1992, 1995, 1997). Similarly, we show that e-network ties, like traditional ties, can have positive career benefits. These findings extend knowledge of e-networks to the professional context where they have not previously received much attention Gremmen et al., 2013; Kegen, 2013; Rand & Bierema, 2009). Further research is necessary though to determine the extent to which e-networks may positively affect other career-related outcomes. Are e-networks similarly useful for achieving more subjective forms of career success, such as career satisfaction? To what extent might e-networks facilitate the attainment of work-life balance or psycho-social support? Along these lines, could e-networks also provide an electronic means to engage in mentoring functions or provide greater access to developmental mentors (e.g., Bonnett, Wildemuth, & Sonnenwald, 2006; DiRenzo, Linnehan, Shao, & Rosenberg, 2010; de Janasz, Ensher, & Heun, 2008), that may facilitate career development in ways other than during job search? Moreover, future research should employ comparative studies that examine these and other effects with respect to both e-networks and traditional networks (e.g., Smith-Jentsch, Scielzo, Yarbrough, & Rosopa, 2008). That is, scholars should seek to compare and differentiate the effects of contacts generated via face-to-face networking vs. electronic networking.

Finally, only a very few studies have specifically addressed the role of gender in e-network outcomes (e.g., Barker, 2009; Brown et al., 2008; Thelwall, 2008; Venkatsubramanyan & Hill, 2009). Previous research on traditional networks has shown that women accrue fewer benefits to career outcomes from their social networks than men (Forret & Dougherty, 2004; Ioannides & Loury, 2004; Mayer, 2009; Morgan & Trauth, 2006; Van Emmerik et al., 2006). Our study provides a potential explanation and practical remedy. We find that heterophilous ties are particularly valuable to women; however, women nevertheless still have fewer ties to men, which therefore limits the value of their networks. As such, although e-networks may be reducing some structural barriers that women face, induced homophily remains a problematic issue in the career advancement of women. We call on scholars to investigate further ways to utilize e-networks, and other mechanisms, to eliminate or bypass the structural barriers that contribute to induced homophily.

Thus far we have discussed only the potential positive outcomes of e-networks. It is important to note that there may also be negative effects. In particular, negative effects may stem from the increasing visibility of job seekers' personal characteristics (and their connections' characteristics) that e-networks provide. This may be of even greater concern for those with visible minority status or disabilities. For example, research has shown that recruiters rely on profile pictures, which they perceive as a valid and truthful source of information about candidates (Clark & Roberts, 2010) and further, that the absence of a profile picture can have a negative effect on recruiter perceptions and the likelihood of being invited for an interview (Edwards, Stoll, Faculak, & Karman, 2015; Van der Land, Willemsen, & Wilton, 2016). Van der Land et al. (2016) recently found that slight variations in candidates' pictures in LinkedIn profiles can influence recruiters' assessments. The authors found that smiling and making eye contact can lead to more positive assessments and that the impact of style of attire varied depending upon the organization. This suggests that because pictures typical in e-network profiles make some minority and disability status visible, minority groups may suffer negative effects; but also, that such effects may be overcome through training in on-line impression management. Future research needs to identify how visual clues about minority status portrayed in profiles are perceived and explore how women and minorities can best take advantage of the potential of e-networks while mitigating possible barriers.

5.1. Limitations and future research

This study is bounded by some limitations that should also be addressed with future research. Findings are based on self-report data. We relied on participants to review their e-networks and report e-network composition, network facilitation, and job search outcomes. There is the potential that participants could have failed to report data accurately or experienced recall biases, although we did reduce the sample to include only those individuals that secured new employment within the last year so as to minimize these effects. Additionally, the date a connection was established is also readily available on LinkedIn, which should further mitigate these potential issues. Nevertheless, as noted previously, social network sites provide documented records of individuals' e-networks. Future studies could seek to take full advantage of this record and collect data directly from the sites or from screen shots submitted by participants. Additionally, network facilitation was measured as a dichotomous yes/no variable, which may not reflect the potential multidimensional nature of this construct. There are many ways in which a contact may help an individual during job search such as introducing the individual to a recruiter or company contact, reviewing and/or passing along a resume, or directing the individual to a particular job ad. As such, future research should seek to develop a more thorough measure of network facilitation that addresses these various possibilities. Further, researchers should consider the use of Likert-type scales so as to capture the extent to which a contact and various facilitating behaviors may have been instrumental to job search success and generate greater variation in responses.

Our sample was limited to users of one professional network site at a single point in time. It may be useful for future studies to include other social network sites to determine if the type of social network site being used may influence the study's relationships. Further, it is possible that individuals may compose different networks or experience different outcomes from social networks on different sites. For instance, there is an increased prevalence of community/industry specific SNS (e.g., researchgate.com) which may contain potentially valuable contacts that are not also included in one's LinkedIn network. Additionally, there remains the possibility for alternative explanations behind the study's relationships. For instance, might it be possible that the female members of LinkedIn are generally more likely to have valuable contacts that are of a higher level than in general networks? Conversely perhaps males may form ties with female contacts for different reasons than women form ties with male contacts? These and further alternatives should be explored. Furthermore, future studies should seek to utilize longitudinal data to address these questions and to explore how outcomes are affected by changes in network composition over time.

This study included individuals in salaried positions, who were currently employed full-time, and had recently obtained new employment. It will be useful for scholars to also consider the value and use of e-networks for individuals in hourly positions and different occupational categories as well, as the value and use of e-networks may vary across vocational contexts. Moreover, this study focused only on gender differences. Future research should consider examining other network composition characteristics beyond gender as well. For instance, heterophily across other network characteristics may have additional effects. Scholars may

want to consider the potential influence of heterophily with respect to industry contacts, the age and/or race of contacts, geographic location of contacts, and various other network composition characteristics. For instance, research suggests that other disadvantaged groups experience similar barriers to gaining valuable network contacts. Future research should explore the e-networks and job search outcomes of other disadvantaged groups as well as potential differences between the e-networks and outcomes of racial minorities, those with visible disabilities, and women given the enhanced visibility to personal characteristics and other contacts provided by e-networks. The influence of these and numerous other network characteristics remain underexplored.

Finally, at the extreme, our findings might suggest that women would be better off having a network of only men. Although, it seems highly unlikely that a woman would have a solely male network, considering this suggests some limits of our findings. Experience suggests that a woman with a solely male network might experience negative consequences for example perhaps in terms of other's perceptions and negative stereotypes or reduced social support. Future research should explore at what point the number of male contacts in the network starts having diminishing returns or adverse effects.

5.2. Practical implications

The value of social and professional networks has become widely known as the career landscape has grown increasingly dynamic. Technology advances have further enabled the power of e-networking and social network sites have the potential to change how individuals make connections and derive value from their networks. Scholars have argued that e-networks may provide a means to overcome structural barriers to women's careers (i.e., induced homophily) because they can provide access to ties across a wider geography with fewer barriers (Knouse & Webb, 2001; Rand & Bierema, 2009). However, our findings suggest that this potential has not yet been fully realized.

Nonetheless, our findings suggest a possible avenue for helping women to overcome barriers inherent in traditional networking due to the potential of e-networks to facilitate access and reach to high value contacts. It is probable that the growing reliance on social network sites may enable female professionals to overcome induced homophily due to structural barriers, such as a lack of access to instrumental ties, scarcity of highly positioned role models, and difficulties in joining traditional networking groups and functions. Social network sites could potentially provide significant networking opportunities heretofore unavailable to women. The relative ease of joining and using social network sites compared to the effort required for face-to-face networking and the non-intrusive nature of electronic social networking could encourage women to develop more effective networks.

Women perceive greater value in online interactions and are more likely to use social network sites than men (Debrand & Johnson, 2008; Hargittai, 2007; Pederson & Macafee, 2007). This, in combination with our findings, suggests that e-networks may help mitigate these issues. We suggest that women may benefit greatly from training that explains the potential of e-networks and the value of gender heterophily and, in particular, encourages them to reach out to valuable male contacts they might otherwise not access. Specifically, our findings suggest that women should seek to increase the gender diversity of their networks and when seeking jobs, women should target requests to male contacts.

A further, and perhaps more controversial, point is that while well-meaning organizations often provide sites targeted exclusively for women and minorities, our study suggests that such sites may not provide the most valuable contacts. Women's networking sites are common: an on-line search pulls up dozens of sites (e.g. Advancing Women, Business Women's Network, eWomenNetwork) as well as lists of "best websites for women (e.g Forbes, "Top 100 Websites for Women?" (www.forbes.com, accessed December 20, 2016). However, we argue that while these sites provide valuable social capital and developmental support, instrumental support may be more likely from highly placed male contacts. Some scholars have argued that men may be more motivated to network 'instrumentally' (Ehrich, 1994; Singh, Kumra, & Vinnicombe, 2002; Van Emmerik et al., 2006). If this is the case, and in light of our findings, we suggest that women should be encouraged not to limit themselves to women's e-networking sites, but rather to join sites with gender diverse members. Moreover, these sites should consider developing programs and systems that specifically expose and connect women to professional male contacts, i.e., that help women enhance gender heterophily in their networks. Not only will this provide high-value contacts, but might also provide examples of more instrumental networking behaviors which they can then model. Organizations seeking to support professional women may want to create gender diverse sites in addition to women only sites and facilitate women in making cross-gender ties as well. Again, establishing formal or informal programs that reduce barriers and induced homophily may be very effective in enhancing women's organizational careers, and may potentially pay dividends by making the organization more attractive during the recruiting process and possibly reduce turnover among female employees over the long-term.

6. Conclusion

In sum, our findings indicate that the composition of men's and women's e-networks differs and that men and women derive different value from their e-networks. Women's e-networks are characterized by greater heterophily and male contacts provide greater value to both women and men. This study is unique in that we focused on working professionals, rather than students, and also on e-networks. Our focus on these allowed insights into the e-networks and outcomes of individuals in real work settings and engaged in networking as it is increasingly practiced, that is, online.

Our findings suggest that individuals having e-networks comprised of greater proportions of male contacts experience shorter job search durations and attain higher salaries upon securing new employment. Additionally, these effects were partially explained by greater instances of network facilitation – the direct assistance of a network contact in job acquisition. As such, this study extends past research that has primarily examined merely the extent of social capital in careers, and instead examines the actual use of social capital during job search (Obukhova & Lan, 2013). Moreover, despite recognition of the value of social networks and research showing that men and women accrue different benefits from their social networks, we have limited knowledge of why individuals derive value from their social networks, and more specifically, how social network composition and value may differ among women and men. Thus, although our focus was on e-networks the findings have implications for social networks in general as well.

Interestingly, we found that heterophily in network composition was beneficial for women but detrimental for men. That is, generating cross-gender contacts was advantageous only to women. Conversely, increased proportions of cross-gender contacts did not enhance the likelihood of network facilitation for men, suggesting that men may be better off cultivating gender homophilous e-networks. This finding begins to address an important gap in our understanding of how gender differences influence the value derived from social networks. Future studies should seek to

build on this work by extending research across types of social network sites and occupational categories. Applied research should explore the extent to which women may be encouraged and trained to take advantage of e-networks to identify and access valuable male ties.

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